

We Claim:

1. An article comprising a molded three-dimensional insulator having dimensions suitable for use in an end cone region of a pollution control device, said insulator comprising ceramic fibers having a bulk shrinkage no greater than 10 percent using the Thermal Mechanical Analyzer test, wherein said insulator is self-supporting, seamless, and has a compressibility value no greater than 750 kN/m^2 when the mount density is about 0.4 g/ml.
2. The article of claim 1, said article further comprising a end cone housing for a pollution control device attached to an inner surface of the molded three-dimensional insulator, attached to an outer surface of the molded three-dimensional insulating material, or a combination thereof.
3. The article of claim 1, wherein the ceramic fibers comprise Al_2O_3 in an amount of at least 20 weight percent and SiO_2 in an amount of at least 30 weight percent based on the weight of the ceramic fibers.
4. The article of claim 3, wherein the ceramic fibers are crystalline, microcrystalline, or a combination thereof.
5. The article of claim 1, wherein the molded three-dimensional insulator is flexible.
6. The article of claim 1, said insulator further comprising an organic binder.
7. An article comprising a molded three-dimensional insulator having dimensions suitable for use in an end cone region of a pollution control device, said insulator comprising ceramic fibers comprising Al_2O_3 in an amount of at least 20 weight percent and silica in the amount of at least 30 weight percent based on the weight of the fibers, said fibers being microcrystalline, crystalline, or a combination thereof, wherein said insulator is self-supporting, seamless, and has a compressibility value no greater than 750 kN/m^2 when the mount density is about 0.4 g/ml.

8. The article of claim 7, further comprising an end cone housing for a pollution control device attached to an inner surface of the molded three-dimensional insulator, attached to an outer surface of the molded three-dimensional insulator, or a combination thereof.

9. The article of claim 7, said insulator further comprising an organic binder.

10. A method of making an end cone region of a pollution control device, said end cone region comprising a molded three-dimensional insulator, said method comprising:

preparing an aqueous slurry comprising ceramic fibers having a bulk shrinkage no greater than 10 percent using the Thermal Mechanical Analyzer test;

vacuum forming a molded three-dimensional preform from the aqueous slurry on a permeable forming die;

drying the preform to produce the molded three-dimensional insulator suitable for use in the end cone region of the pollution control device, said insulator being self-supporting and having a compressibility value no greater than 750 kN/m^2 when the mount density is 0.4 g/ml .

11. The method of claim 10, wherein said vacuum forming further comprises inserting the preform into or onto a shape-retaining device while the preform is supported by the permeable forming die, transferring the preform to the shape-retaining device, and removing the permeable forming die.

12. The method of claim 10, wherein the shape-retaining device is an inner end cone housing or an outer end cone housing of an end cone region of a pollution control device.

13. The method of claim 12, wherein the insulator is attached to the end cone housing.

14. The method of claim 10, wherein the insulator is seamless.

15. The method of claim 10, wherein the ceramic fibers are microcrystalline or crystalline.

16. The method of claim 10, wherein the ceramic fibers comprise Al_2O_3 in an amount of at least 20 weight percent and SiO_2 in an amount of at least 30 weight percent based on the weight of the ceramic fibers.

17. The method of claim 10, wherein the ceramic fibers comprise Al_2O_3 in an amount of at least 20 weight percent and silica in the amount of at least 30 weight percent, the ceramic fibers are crystalline, microcrystalline, or a combination thereof, and the slurry further comprises an organic binder.

18. A method of making an end cone region of a pollution control device, said end cone region comprising a molded three-dimensional insulator, said method comprising:
preparing an aqueous slurry comprising ceramic fibers comprising Al_2O_3 in an amount of at least 20 weight percent and silica in the amount of at least 30 weight percent based on the weight of the fibers, said fibers being microcrystalline, crystalline, or a combination thereof;

vacuum forming a molded three-dimensional preform from the aqueous slurry on a permeable forming die; and

drying the preform to produce the molded three-dimensional insulator suitable for use in the end cone region of the pollution control device, said insulator being self-supporting and having a compressibility value no greater than 750 kN/m^2 when the mount density is 0.4 g/ml .

19. The method of claim 18, wherein said vacuum forming further comprises inserting the preform into or onto a shape-retaining device while the preform is supported by the permeable forming die, transferring the preform to the shape-retaining device, and removing the permeable forming die.

20. The method of claim 18, wherein the shape-retaining device is an inner end cone housing or an outer end cone housing of a pollution control device.

21. The method of claim 19, wherein the insulator is attached to the end cone housing.
22. The method of claim 18, wherein the insulator is seamless.
23. The method of claim 18, wherein the slurry further comprises an organic binder.